Nachi Drill
Materials & Coating Technolgy

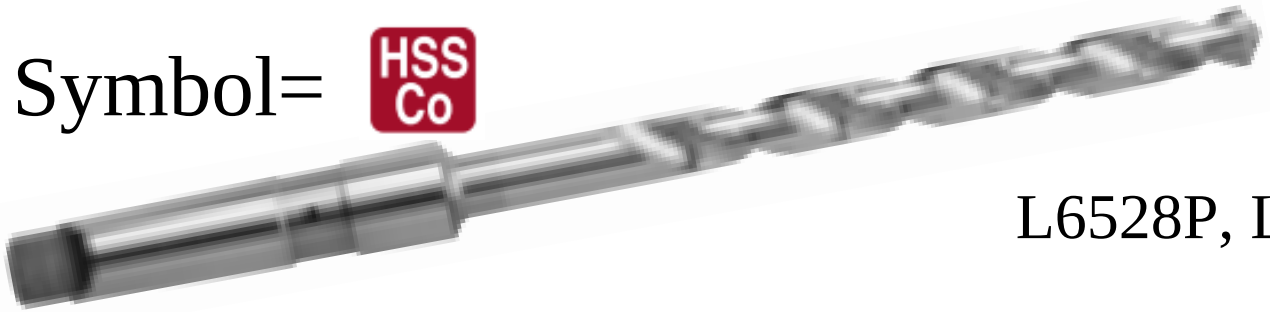
Nachi Materials

- HSS = High Speed Steel
- General Purpose
- Symbol= HSS

EX – L500, L520P, L551, L601,

L501(A & P), L517P, L561(P), L563, L545P, L651, L575

- HSSCo = Cobalt High Speed Steel
- HSS With Added Cobalt for Wear Resistance
- Symbol= HSS Co



EX – L6517U,

L6528P, L6541P, L6520,

L6501, L6563, L6531, L6551, L581, L683

Nachi Materials

- FMX = Fine Melting HSS
- Fine/Uniform Grain Structure Melted HSS
- Symbol= FMX

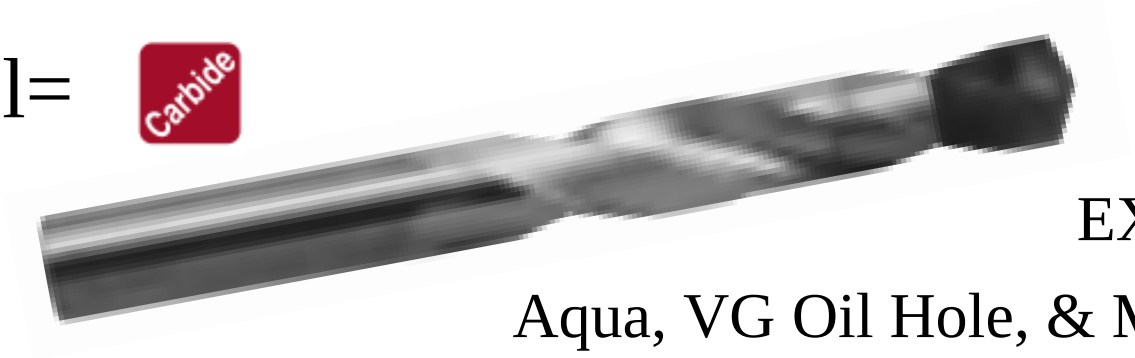
EX – AG-SUS Drills

- FAX = High Grade Powder HSS
- Fine/Uniform Compacted & Sintered HSS
- Symbol= FAX

EX – SG Drills

Nachi Materials

- Carbide = Tungsten Carbide
- Compacted & Sintered 3 X Stiffer than Steel
- Symbol= Carbide



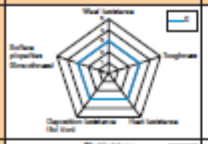
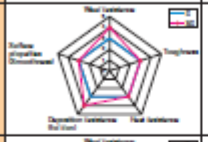
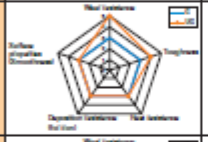
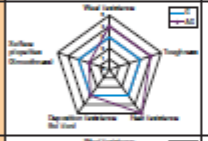
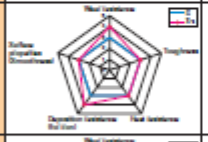
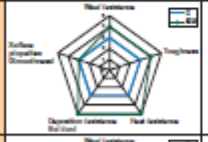
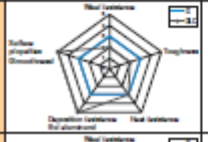
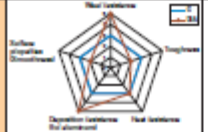
EX – 9501D,

Aqua, VG Oil Hole, & MQL Drills

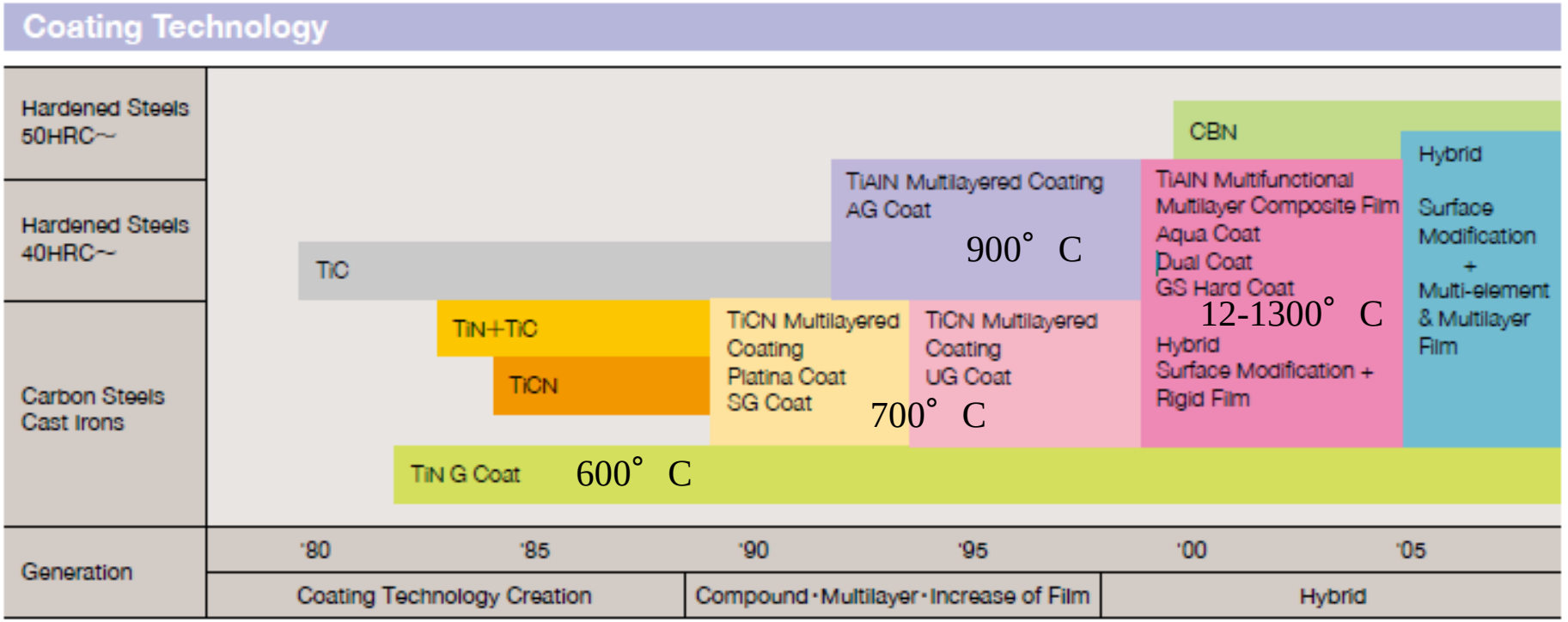
Coatings Advantages

- Better Wear Resistance
- Better Toughness
- Better Heat Resistance
- Better Lubrication

Comparison of characteristics of NACHI coating film

Name	Evaluation of relative characteristics	Features
G (TiN)		- The basis for PVD coating. Coating method in common use.
SG		- Composite multi-layer film coating method characterized by improved wear resistance as compared to TiN.
UG		- Coating method characterized by adoption of a TiCN based composite multi-layer film to provide improved wear resistance.
AG		- Coating method based on the TiAlN film characterized by superb resistance to heat and wear. Commercialized for use in high-speed steel.
X's		- Coating method for cemented carbide end-milling cutters, based on the TiAlN film characterized by superb resistance to heat and wear.
AQUA		- Coating method characterized by excellent heat resistance and lubricity of the workpiece. Compatible with both dry machining and wet machining.
DLC		- Coating method characterized by a film having a structural characteristic intermediate between graphite and diamond, where the surface is provided with a smooth film, thereby enhancing resistance of aluminum alloy and others to deposition.
DIA		- Coating method best suited to processing of non-ferrous metal, graphite and aluminum alloy, where NACHI is the first to realize commercialization of a diamond film.

Coatings Development and Approx. Temperature Max



Nachi Coatings

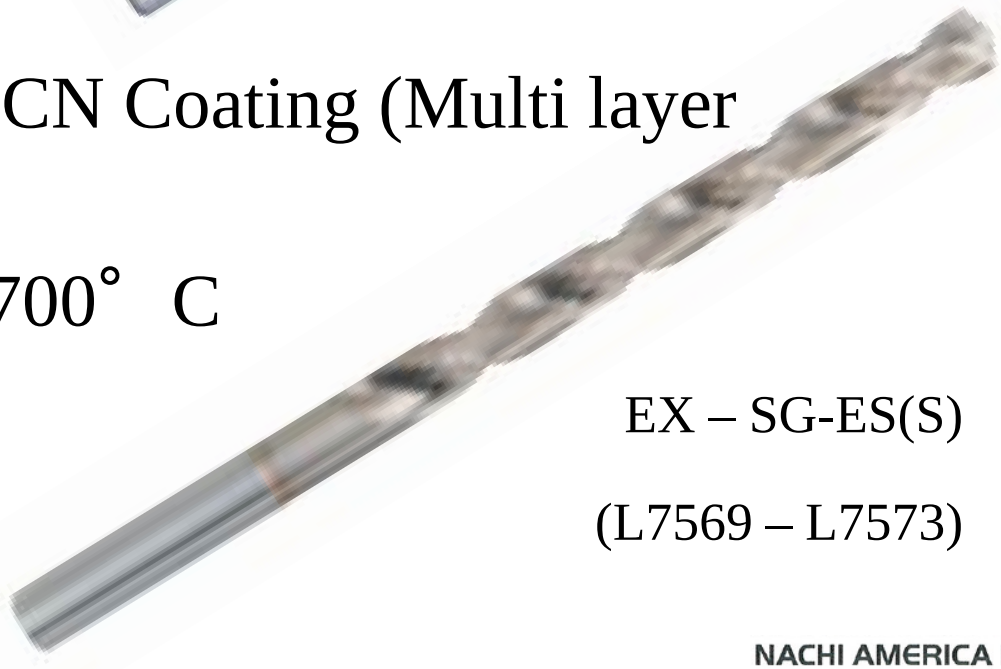
- G-Coating = TiN Coating
- Service Temperature= 600° C
- Color= Bright Gold Yellow
- Symbol= G

EX – L520P, L501, L7P, L561, L545P

- SG-Coating = TiN + TiCN Coating (Multi layer Coating)
- Service Temperature= 700° C
- Color= Gold Yellow
- Symbol= SG

EX – SG-ES(S)

(L7569 – L7573)

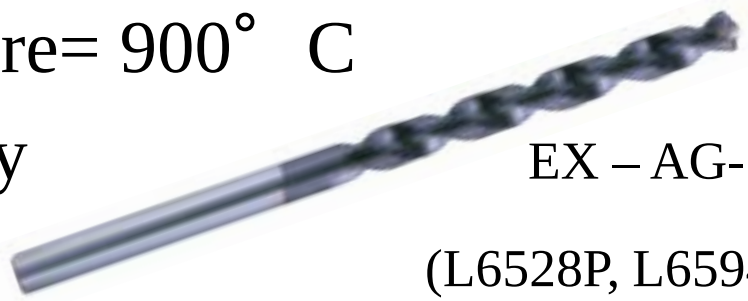


Nachi Coatings

- UG-Coating = TiCN Coating (Multi layer Coating)
- Service Temperature= 700° C
- Color= Blue-Gray
- Symbol= UG 17U, L6528P)

EX – UG POWER

- AG-Coating = TiALN (Multi layer Coating)
- Service Temperature= 900° C
- Color= Violet-Gray
- Symbol= AG



EX – AG-SUS & POWER

(L6528P, L6594-96, L6540-41)

Nachi Coatings

- Aqua-Coating = TiALN Coating + Lubrication Film (Multi layer Coating)
- Service Temperature= 900˚ C
- Color= Aqua Blue
- Symbol= AQ

EX – Aqua Drills

(L9550-52, L9558, L9556, L9546, L9448)

- X's-Coating = TiALN (Multi layer Coating) for End Mills
- Service Temperature= 900˚ C
- Color= Violet-Gray
- Symbol= M X'S Meister (L9408, L9322, L9332)

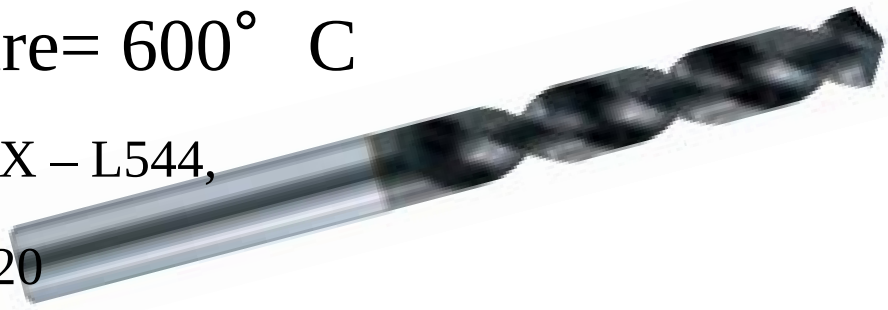
EX – X'S Mill &

Nachi Coatings

- GS-Coating = TiALN + Al-Ti-Cr Coating (Multi layer Coating)
- Service Temperature= 1100˚ C
- Color= Violet-gray
- Symbol= GS

EX – VG Oil Hole, MQL Drills, (L9586-89, L9566, ETC.)

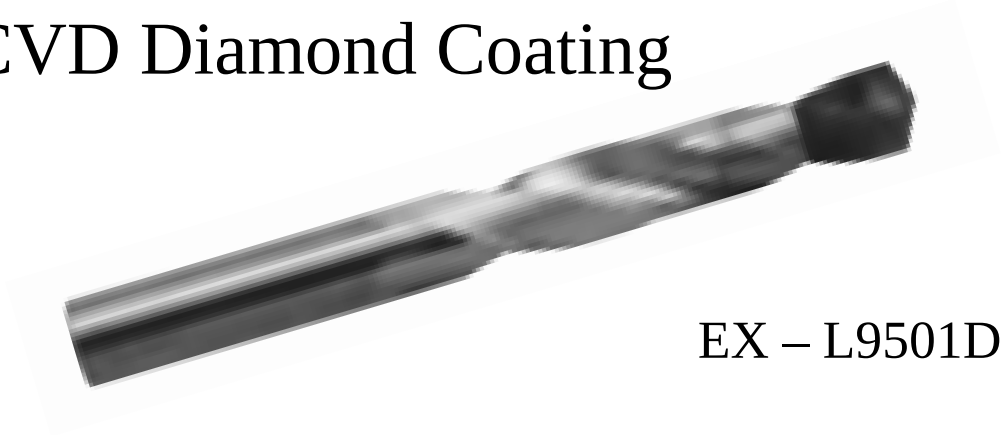
- DLC-Coating = Diamond Like Carbon
- Service Temperature= 600˚ C
- Color= Black
- Symbol= DLC



EX – L544, l4, l9520

Nachi Coatings

- Diamond-Coating = CVD Diamond Coating
- Color= Gray
- Symbol= DIA



EX – L9501D

Thank You